REMARKS

Claims 1-12 were originally pending in the application and are duplicates of the claims originally pending in USSN 10/243,652. Claims 2-11 are allowed in that application and claims 1 and 12 are rejected. Applicants are canceling claims 2-11 and 13 from this application, leaving claims 1 and 12. In addition, claim 14 has been amended to depend from claim 1 alone. Finally, claims 15 and 16 are newly added.

Claim Rejections - 35 U.S.C. § 102

In the parent application, claims 1, 12 and 14 were rejected under 35 U.S.C. § 102(b) as being anticipated by Lee (6,052,652). This rejection should not apply to the present application for at least the following reasons.

As preliminary matter, Applicants wish to note that the rejection for anticipation requires that every limitation of the claim be found in a single prior art reference. On the basis of a careful review of the teachings of Lee, Applicants respectfully submit that the subject matter as expressly set forth in claims 1 and 12 is not found in the reference. Accordingly, claims 1 and 12, and the claims dependent therefrom, should be patentable.

The Invention

The present invention relates to a design support apparatus and method that permits the identification, at the time of design of a product, of the possibility that a problem based upon strength or stress may occur. The architecture for the invention is illustrated generally in Fig. 2. An example of a hierarchal structure used in the invention is illustrated in Fig. 3. The method according to the present invention is illustrated in Fig. 7.

With reference to Fig. 2, the design support apparatus 201 has plural dictionary units including a definition attribute dictionary unit 202, a strength dictionary unit 203, a stress dictionary unit 204 and a comparison report dictionary unit 205. Additional units related to the strength parameter include a strength obtaining unit 209 and a strength calculation unit 212. Similarly, units relating to stress include a stress obtaining unit 210 and a stress calculation unit 213. A comparison report unit 214 receives the input from the separate strength calculation unit 212 and stress calculation unit 213.

As explained at page 17 of the specification with regard to Fig. 3, the strength dictionary unit 203 stores a name of a strength, a name of a parameter of a control attribute necessary for calculating the strength, and a procedure for calculating a value associated with the strength using the value associated with the parameter of a control attribute. The strength dictionary unit 203 stores a variety of parameters as parameter names of control attributes. It also stores an equation as a process of calculating a strength value. The data structure for these parameters is illustrated in Fig. 4.

Similarly, the stress dictionary unit 204 stores a name of a stress, a name of a parameter relating to the stress, and a procedure for calculating the value associated with the stress using the value associated with the parameter. The stress dictionary unit 204 stores the variety parameters together with an equation for calculating the stress value using those parameters. An example of the content of the data structure for the stress dictionary is illustrated in Fig. 5.

The information stored in the two dictionaries in table form may be accessed by the comparison report dictionary unit 205, which stores a strength name, a stress name, a procedure

for comparing those strength names and stress names and report information representing information to be reported with a result of the comparison satisfies a predetermined condition.

As explained with regard to Fig. 7, on the basis of an input of definition attribute names of a product to be designed (step S701), information is obtained as to parameter names (S702), strength names (S703), stress names (S704). Thereafter, strength values (S708) and stress values (S709) are separately calculated. A determination is then made at step S710 as to whether the strength value and stress values satisfy a condition. Clearly, the processing of strength and stress are completely separate operations. They do not rely upon each other.

As set forth in claim 1, the comparison reporting unit compares the (1) calculated strength value with the (2) calculated stress value. One value is not derived from the other value. Then, report information which is associated with the comparison, is generated as a report. A similar limitation appears in method claim 12 and program product claim 14.

Lee

The technique disclosed by Lee is for computing stress values for each group of elements of a structure based on the actual load and stress distribution ratio, and then computing a "required strength" based on the computed stress valued, likewise the technique raised by Lee as prior art (col. 1, lines 35-37). The teachings in Lee are only peripherally related to the present invention.

The Examiner notes that the teachings in Lee relate to a design support apparatus having an input unit. The method of analyzing the strength of a structure is focused on the cage of an elevator system, but may be applied to a vehicle, aircraft, ship, etc. (col. 6, lines 16-25). The

Examiner asserts that there is a strength calculation unit and a stress calculation unit. With reference to Fig. 3, the only illustration is of a stress computation unit 3. The related function of computation unit 4 is for changing the stress CSU with respect to the unit load to a matrix form. At col. 5, line 66, it is described that the output unit 4 analyzes the strength of each element (P0-P7) based on the actual stress (CSA), computed through previously described steps.

The patent mentions at col. 3, lines 32-34 that the apparatus may be operated for "analyzing the strength of the structure." From the description, it is clear that the calculation of strength is focused on the entire strength of the structure and is based upon the stress of a plurality of concern elements (CS). As explained at col. 3, lines 42-47, the concerned stresses are grouped, and the analyzing operation is performed based on the group of concerned stresses. An illustration of the stresses is provided at col. 3, line 58 - col. 4, line 8.

Notably, there is no comparison of a stress calculation and a strength calculation. The strength calculation in Lee is based upon the stress calculation. Thus, the literal language of the rejected claims is not found in Lee. Furthermore, such comparison as claimed would not be obvious since the clear and direct teaching of the reference is that strength values are derived from calculated stress values and are not compared to them.

The Examiner considers that a strength calculation unit is disclosed by Lee in col. 2, lines 4-8. However, what is discloses in col. 2, lines 4-8 is a stress calculation unit. Thus, the Examiner in not correct as to this point. A strength value output by the output unit (Lee Fig. 3) is a value calculated from a stress value (probably by multiplying the stress value by a safety factor). That is, the technique of Lee does not compare a "calculated stress value" and a

"calculated strength value" to determine whether a spec is satisfied or not. On the other hand, according to the technique of the present application, calculation of a stress value and a calculation of a strength value is not like that a calculated result of one derives the other. Calculations of both the values are performed independently from each other, and both of the values are compared with each other after calculations of both of the values are finished.

Accordingly, the technique of the present application and the technique of Lee are greatly different in their principles, architectures, and effects, and even those skilled in the art can not easily achieve the technique of the present application based on the technique of Lee.

Entry and consideration of this Amendment, and early allowance of the presently claimed invention, are respectfully requested.

Respectfully submitted,

Alan J. Kasper
Registration No. 25,426

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: December 31, 2003